

Increasing Patient Access and Improving Patient Outcomes in Diabetes through Pharmacy-Based Disease Management Services

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Learning Objectives

- Describe rationale for initiation of El Rio's Pharmacy Demonstration Project
- Explain El Rio's Program
- List lessons learned and barriers to continuation and expansion of pharmacy services

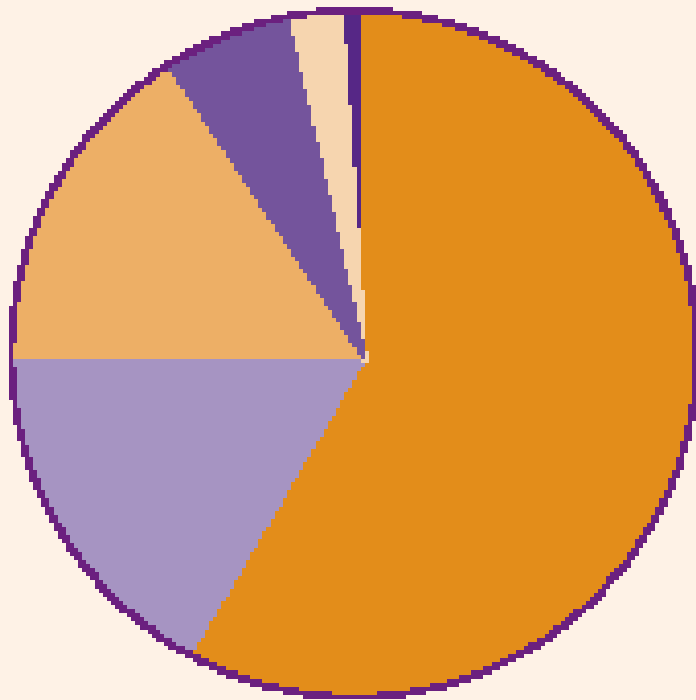
El Rio Health Center

- Community Health Center
- 35 years in Tucson, Arizona
- > 60,000 patients enrolled
- 13 sites

El Rio's Main Clinic



Demographics by Culture/Race






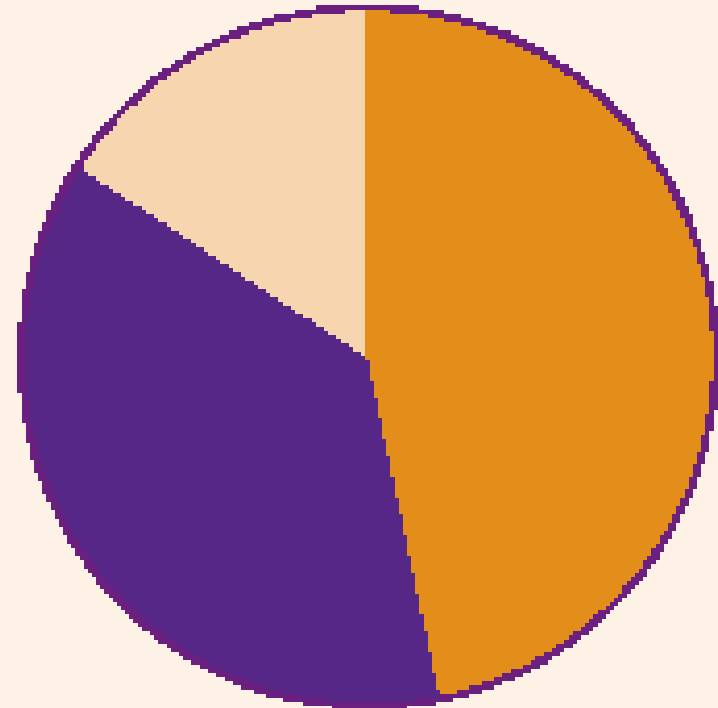
Demographic
by Culture / Race

| | | |
|------------------------|--------|------|
| Hispanic | 30,204 | 59% |
| Unreported | 7,923 | 16% |
| Anglos | 6,972 | 14% |
| Native American | 4,407 | 8.6% |
| African American | 1,183 | 2% |
| Asian/Pacific Islander | 222 | .4% |

Demographics by Age

Demographic
by Age

| | | |
|---|------------------------------|-----|
|  | <i>Pediatrics (0-17 yrs)</i> | 44% |
|  | <i>Adults (18-54 yrs)</i> | 42% |
|  | <i>Seniors (55+ yrs)</i> | 14% |



El Rio Services

- Onsite Pharmacy (3 sites)
- Behavioral Health
- Dental
- HIV/AIDS
- Homeless Medical Outreach
- Lab/X-Ray/Diagnostics
- Gynecology/Deliveries
- Optical
- Primary Care
- School-Based Pediatric Clinics

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El Rio's Pharmacy Demonstration Project

- In August 2001
 - El Rio Clinic provided a pharmacist managed diabetes (DM) clinic through one of the Comprehensive Pharmacy Services Grants awarded by the Office of Pharmacy Affairs (OPA)

Background

- The Office of Pharmacy Affairs (OPA) a component of the Health Resources and Services Administration's (HRSA) Special Programs Bureau (SPB) has three primary functions:
 - Administration of the 340B Drug Pricing Program, through which providers may purchase prescription medication at significantly reduced prices
 - Development of innovative pharmacy services models and technical assistance
 - Service as a federal resource about pharmacy

Background

- OPA emphasizes:
 - Importance of comprehensive pharmacy services being an integral part of primary health care
 - Comprehensive pharmacy services include:
 - Patient access to affordable pharmaceuticals
 - Application of "best practices" and efficient pharmacy management
 - Application of systems that improve patient outcomes through safe and effective medication use

Clinical Pharmacy Demonstration Projects

(Innovative Pharmacy Practice)

- Grants to health centers networks
 - FY 2000 = \$3.4 Million; 14 Grants
 - FY 2001 = \$ 1+ Million; 3-4 Grants Expected
- Working Relationship with College of Pharmacy
- Other potential network partners:
 - Primary Care Associations
 - AHECs
 - Disproportionate Share Hospitals
 - Individual Pharmacists and Pharmacies
- National Health Service Corps Loan Repayment



Clinical Pharmacy Demonstration Projects (Cont)

Concepts promoted

“Comprehensive Pharmacy Services”

- Affordable access to pharmaceuticals
- Efficient management
- Focus on improved patient outcome (clinical pharmacy)



Clinical Pharmacy Demonstration Projects (Cont)

Concepts promoted

- Pharmacists as members of the healthcare team
- Disease state management
- Outcomes research: assessing impact of pharmacist services on patient outcomes
- Appropriate and optimal use of technology



At the Same Time

- Opportunities opened with AZ Bill 2415
 - Pharmacists' prescriptive authority
- Collaborative agreements with providers and patients created

Diabetes

- Major cause of morbidity and mortality
- Cost: \$132 billion dollars in 2002

Opportunities to improve care:

- Quality measures (HEDIS)
- Lipid management
- Blood Pressure Management
- Appraiser medications (ACEIs/ARBs, ASA)

Objectives/Method

- To evaluate changes in or use of metabolic parameters, blood pressure, aspirin (ASA), ace inhibitor (ACEIs) and/or angiotensin blocker (ARBs) use
- Improve comprehensive access to diabetes care
- Access ® database created in 2/02 for patient tracking—pivotal to success of program

Access® Database

- Data collected
 - Demographics
 - Medical history
 - Medications
 - Labs
 - Vitals
 - Preventative Services
 - SOAP notes to print for chart

Results

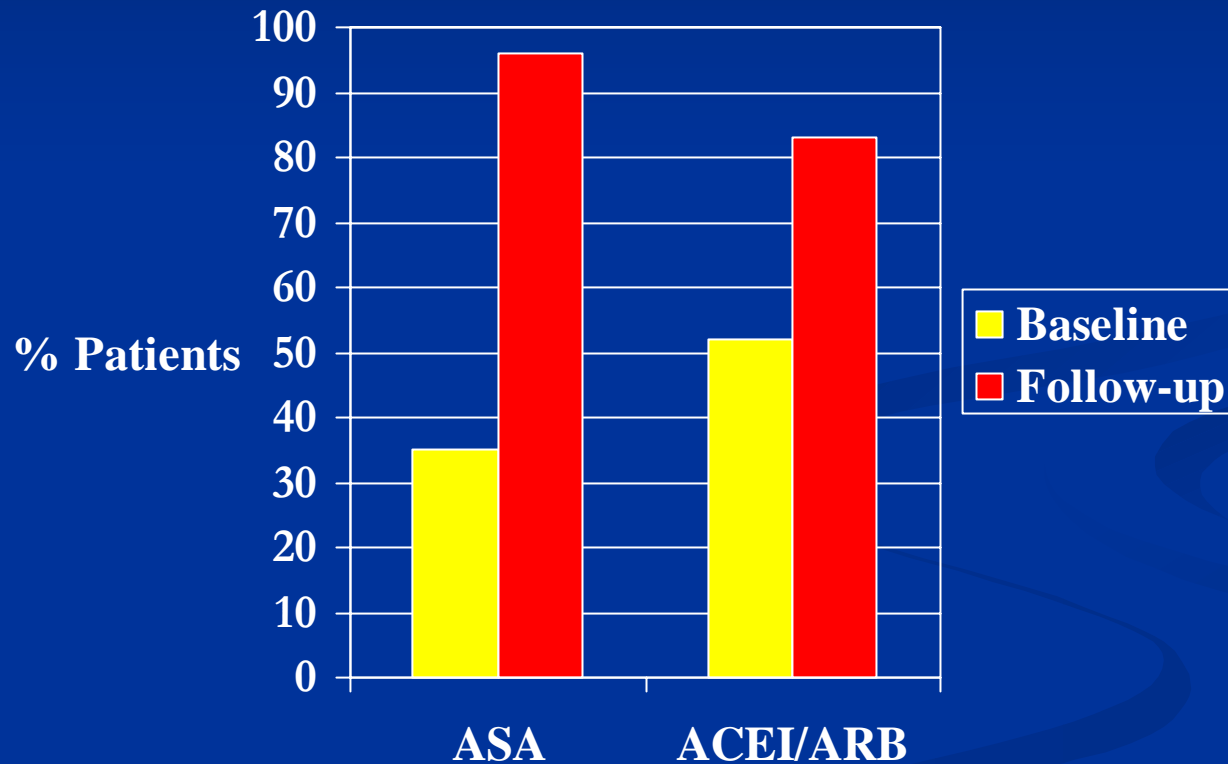
Changes from Baseline to Follow-Up in Metabolic and Blood Pressure Measures*

| Parameter | # Pts | Baseline (Mean) | FU (Mean) | Diff. | 95% CI | P-value |
|--------------|-------|--------------------|--------------|-------|------------|---------|
| TC (mg/dL) | 392 | 201 | 173 | 28 | 23 to 34 | <0.001 |
| TG (mg/dL) | 392 | 258 | 192 | 67 | 33 to 101 | <0.001 |
| HDLc (mg/dL) | 390 | 46.1 | 42.8 | 3.3 | 2.3 to 4.3 | <0.001 |
| LDLc (mg/dL) | 377 | 108 | 93 | 15 | 11 to 19 | <0.001 |
| SBP (mm/Hg) | 393 | 126 | 121 | 5 | 2 to 7 | <0.001 |
| DBP (mm/Hg) | 393 | 75 | 71 | 4 | 3 to 5 | <0.001 |
| A1C (%) | 392 | 9.7 | 7.7 | 1.9 | 1.7 to 2.1 | <0.001 |
| Gluc (mg/dL) | 386 | 213 | 160 | 53 | 42 to 64 | <0.001 |

*Numbers rounded to nearest whole number except for A1C and HDLc.

Results

Changes from Baseline to Follow-Up for Patients on ASA and ACEIs/ARBs*



* 42 with ASA contraindication; 26 pts had contraindication to ACEI/ARB

Clinic Outcomes

- Study shows positive and sustained impact of a DM service
- Analysis of preventive services showed similar results
- Improvements in management of complex diseases states through comprehensive services
- Approximately 4000+ more visits for DM care

Lessons Learned

- Creation of Electronic Medical Record pivotal to success of program
 - Allowed for validation of clinic impact
 - Funding for addition of second pharmacist
 - Provider “buy in” for continuous referral source

Barriers: Solutions

- **Provider acceptance: Collaboration**
- **Patient enrollment and retention**
 - Cultural and language barriers: Awareness
 - Transportation barriers: Flexibility
 - Lack of enthusiasm: Educate
- **Funding: Creativity**

Sustainability

- Document comprehensive interventions and outcomes
- Create opportunities for funding sources
 - Grants (Pascua)
 - Dual funding (collaboration with a college of pharmacy)
 - Private Donations (El Rio Foundation)
 - Publications
 - Billing (Pay for Performance)
 - Direct billing (pump starts, sliding scale fees)
 - Provider status

Collaboration

- Affiliation with University of Arizona College of Pharmacy
 - Rotation sites for student/residents
 - Exposure to up and coming practitioners
 - Coordinate projects with the students
 - Utilize resources, i.e. statisticians, equipment
 - Joint effort between El Rio and academicians to advance practice, i.e. publications

Example of Database to Document Interventions

Microsoft Access - [Switchboard Form : Form]

FileEditViewInsertFormatRecordsToolsWindowHelp

Diabetes Clinic

El Rio Health Center

Preventive Reports

Influenza vaccine > 270 days

Influenza vaccine > 360 days or none on record

Pneumococcal vaccines > 5 years or none on record

Foot Exam Yearly Report

Foot Exam Abnormal Quarterly Report

Ophthalmic Exam Late Report

Lipid Reports

LDLc > 100 DM2 on lipid med

LDL > 100 Type 1 Report

LDL > 100 Type 2 Report

LDL > 365 Days Report

Open Patient Records

SOAP Notes Active Patients

Exit Program

Current Clinic Stats for Patients

HbA1c Proteinuria Reports

HbA1c by > Value

HbA1c > 180 days

HbA1c > 365 days

Proteinuria by Value for ACEIs and ARBs

Proteinuria by Value NO ACEIs or ARBs

Proteinuria > 365 days Report

Blood Pressure Reports

SBP by > Value NO ACEIs or ARBs

SBP by > Value on ACEIs or ARBs

Thyroid Reports

TSH > 365 Days

TSH by > Value

Form View

Microsoft Access - [Patient Main Form]

FileEditViewInsertFormatRecordsToolsWindowHelp

DEMOGRAPHICS

MRN131DOB10/1/1933PVD?Type?Lastpneumovax4/29/1999Clinic DC date:Start Date8/20/2001Age69 YearsHxTIA/strokeType?Last influenzavax10/17/2002Patient StatusActiveLast NameNAINsuranceIDPacifiCare 0HxCarotid?HypertensioBaseline ASA useNoFirst NameNAPCPMDWilsonChildbearingCAD?Baseline ACEI useYesGenderMaleReferMDWilsonHxlgbabv?AllergiesNKDAEthnicityHispanicSmoker?Non smoker

Medication Entry and EditVitalsHbA1c/Proteinuria/TSHLipid Panels and LFTsRenal PanelsEye and Foot Exams

Entry and Edit of Medications

Start Date7/30/2002Stop DateMedicationatenololDose50unitsmgFrequencyQD

Record: 1 of 11

View Current Medications (Read Only)

| | Start Date | Medication | Dose | units | Dosed |
|--|------------|------------------|------|-------|-------|
| | 9/13/2001 | aspirin | 325 | mg | QD |
| | 7/30/2002 | atenolol | 50 | mg | QD |
| | 11/21/2001 | hydrochlorothia; | 25 | mg | QD |
| | 3/28/2002 | insulin isophane | 34 | units | QAM |
| | 7/30/2002 | insulin isophane | 5 | units | QPM |
| | 8/21/2001 | insulin regular | 18 | units | QAM |
| | 10/4/2001 | lisinopril | 40 | mg | QD |
| | 8/30/2001 | nisoldipine | 30 | mg | BID |
| | 9/16/2002 | sertraline | 50 | mg | QD |

Record: 1 of 10

Subjective InformationAssessment and Plan

Date10/17/2002

xxxxxxxxxxxx

Record: 1 of 5

Find RecordAdd RecordDelete RecordClose FormOpen SOAP NoteSTOP

Record: 2 of 412Form View

Microsoft Access - [Patient Main Form]

File Edit View Insert Format Records Tools Window Help

Date Arial 10 B I U

DEMOGRAPHICS

MRN 131 DOB 10/1/1933 PVD? ☐ Typel? ☐ Lastpneumovax 4/29/1999 Clinic DC date:
Start Date 8/20/2001 Age 69 Years HxTIA/strok ☐ Typell? ☒ Last influenzavax 10/17/2002 Patient Status Active
Last Name NA InsuranceID PacifiCare 0 HxCarotid? ☐ Hypertensio ☒ Baseline ASA use No
First Name NA PCPMD Wilson Childbearing ☐ CAD? ☐ Baseline ACEI use Yes
Gender Male ReferMD Wilson Hxlgbaby? ☐ Allergies NKDA
Ethnicity Hispanic Smoker? Non smoker

Medication Entry and Edit Vitals HbA1c/Proteinuria/TSH Lipid Panels and LFTs Renal Panels Eye and Foot Exams

Lipid Panels

| | Date | Fasting | Cholesterol | Triglycerides | HDLc | LDLc |
|---|-----------|-------------------------------------|-------------|---------------|------|------|
| ▶ | 5/3/2002 | <input checked="" type="checkbox"/> | 163 | 69 | 65 | 84 |
| | 3/29/2001 | <input checked="" type="checkbox"/> | 153 | 70 | 60 | 79 |
| * | | <input type="checkbox"/> | | | | |

Record: 1 of 2

Liver Function Tests

| | LFT Date | ALT/SGPT | AST/SGOT |
|---|------------|----------|----------|
| ▶ | 5/3/2002 | 18 | 14 |
| | 11/16/1999 | 16 | 18 |
| * | | | |

Record: 1 of 1

Subjective Information Assessment and Plan

Date 10/17/2002

xxxxxxxxxxxxxx

Record: 1 of 5

Find Record Add Record Delete Record Close Form Open SOAP Note

Record: 2 of 412

Form View

Progress Note

Date: 12/22/2003

Pt Name: Lily H. Godoy

Medical Provider: England

MRN: 2161001

Referring Provider: Gattja

Subjective:

Mrs. Godoy in today for diabetes follow up.

Objective:

| | | | | | | | |
|---------------|------------|----------------|-----------|---------------|-----------|---------------|-------------------------------------|
| Height | 60 inches | Date of Prenat | 9/20/2003 | Date of A/G/C | 9/29/2003 | Date of Lipid | 7/2/2003 |
| Weight | 173 lbs | BUN | 9 | Alb/Glob/G | 3.9 | Fasting | <input checked="" type="checkbox"/> |
| Systolic BP | 100 mm.Hg | Creatinine | 0.6 | | | Cholesterol | 194 mg/dL |
| Diastolic BP | 58 mm.Hg | Glucose | 41 mg/dL | Date of TTT | 7/2/2003 | Triglycerides | 94 mg/dL |
| Pulse | 64 bpm | Prothromb | 38 mEq | ALD/CPT | 18 | HDL | 38 mg/dL |
| | | | | ASD/CPT | 57 | LDL | 118 mg/dL |
| Date of HbA1c | 12/22/2003 | Date of TSH | 3/26/2002 | | | | |
| HbA1c | 6.2 % | TSH | 2 | | | | |

Current Medications

| Medication | Dose | Unit | Schedule |
|------------------|-------|------|----------|
| aspirin | 81 | mg | Q.D. |
| atorvastatin | 10 | mg | Q.D. |
| conjugated estro | 0.625 | mg | Q.D. |
| glybide | 20 | mg | B.I.D. |
| metformin | 1000 | mg | B.I.D. |
| moexipril | 15 | mg | Q.D. |
| progilazone | 45 | mg | Q.D. |

Date

Preventive Service

11/14/2002 Last Pneumococcal Vaccine
11/6/2003 Last Influenza Vaccine
12/22/2003 Last Exam: Monofilament
Normal
5/5/2003 Last Ophthalmic Exam:
No DM R-Yu 1 year-Dr. Thejo

Assessment and Plan

Spent 30 minutes with Mrs. Godoy discussing:

1. DM: RBS 145 comes in with A1C of 6.2% today. Congratulated her on her continued success and encouraged her to take meds as listed and exercise as she has been. Will continue to work closely with her to maintain goal A1C < 6.5%.
2. BP aligned < 130/80 at 100/58.
3. Feet: Monofilament with normal sensation (see attached)-no infections or calluses noted on either foot. Discussed foot care with her.
4. Med review: Continues to take meds as listed along with ADA pt.
5. Influenza vaccine received on 11/6/03.

Appt scheduled for repeat fasting lipid panel in early March to large LDL goal < 100. She is to call prior to appt. with any questions or concerns.

Sandra Leal, Pharm.D., CDE - AZ: 512341-Pager: 218-8427

Microsoft Access - [Switchboard Form : Form]

FileEditViewInsertFormatRecordsToolsWindowHelp

Diabetes Clinic
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Proteinuria by Value NO ACEIs or ARBs

Proteinuria > 365 days Report

Blood Pressure Reports

SBP by > Value NO ACEIs or ARBs

SBP by > Value on ACEIs or ARBs

Thyroid Reports

TSH > 365 Days

TSH by > Value

Form View

Statistics for Visits

Patient Load

| | |
|------------------------|-----|
| | 0 |
| Active | 291 |
| DC Controlled | 14 |
| DC Death/Mixed | 20 |
| No Show/Non-Compliance | 160 |

Gender of Patients

| | |
|--------|-----|
| | 0 |
| Female | 316 |
| Male | 170 |

Average Age of Patients

54.8 Years 13.8 StdDev

Ethnicity of Patients

| | |
|------------------|-----|
| | 6 |
| Caucasian | 50 |
| Hispanic | 360 |
| African American | 12 |
| Native American | 55 |
| Other | 4 |

Payer Breakdown

| | |
|------------------------|----|
| | 0 |
| Medicare I | 2 |
| Self Pay | 84 |
| Mercy Care Yaqui | 58 |
| Medicare | 34 |
| Mercy Care | 73 |
| Pima Med H | 29 |
| United Health Care | 13 |
| APIPA | 54 |
| Aetna | 10 |
| BCBS | 5 |
| University Family Care | 31 |
| PachCare OM Pueblo | 41 |
| Health Choice | 15 |
| PCAP | 36 |
| Insigroup of Arizona | 1 |

Most Recent Averages

| Parameter | Mean | StdDeviation |
|-----------------------|-------|--------------|
| SBP (mm Hg) | 117.3 | 23.0 |
| DBP (mm Hg) | 70.2 | 12.8 |
| Cholesterol (mg/dL) | 171.0 | 41.0 |
| Triglycerides (mg/dL) | 181.6 | 141.7 |
| HDLc (mg/dL) | 46.5 | 11.1 |
| LDLc (mg/dL) | 90.3 | 29.7 |
| Creatinine (mg/dL) | 1.0 | 0.6 |
| Glucose (mg/dL) | 167.9 | 97.5 |
| HbA1c (%) | 7.6 | 1.6 |

Change from Baseline (negative = dec)

| | Average | % |
|-----------------------------|---------|---|
| Time between Visits (days) | 529.34 | 2 |
| Change in Weight (Lbs) | -3.40 | 3 |
| Change in DBP (mm Hg) | -2.95 | 1 |
| Change in SBP (mm Hg) | -4.87 | 1 |
| Time between Lipids (Days) | 463.99 | 2 |
| Change in TC (mg/dL) | -40.95 | 6 |
| Change in TG (mg/dL) | -105.77 | 4 |
| Change in HDL (mg/dL) | -1.78 | 1 |
| Change in LDL (mg/dL) | -20.47 | 4 |
| Time between HbA1c (Days) | 423.65 | 2 |
| Change in HbA1c (%) | -2.24 | 2 |
| Time between Glucose (Days) | 465.65 | 2 |
| Change in Glucose (mg/dL) | -63.20 | 1 |

Conclusion

- The demonstration project has been successful and sustainable over a period of 4 years
- Journal articles about success have been published
 - Diabetes Care, December 2004
 - Journal of Health Care for the Poor and Underserved, in press
- Successful outcomes and creative funding has resulted in:
 - 2 additional clinical pharmacist positions at El Rio
 - 1 pharmacy practice resident

Conclusion

Access to needed pharmaceuticals, when delivered as part of a comprehensive pharmacy service, makes a substantial and affordable contribution to improving the health status of the mostly low-income patient population served by community health centers!

Contact Information

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